

U.S. Patent Application Serial No. 10/561,791
Response to OA dated March 19, 2008

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AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claim 1 (Currently Amended): A method of forming a wheel rim hump portion along a circumferential direction on an outer circumferential wall surface of a vehicular wheel rim gripped by gripping means, comprising the steps of:

supporting said vehicular wheel rim from the outer circumferential wall surface thereof with a first die surrounding the vehicle wheel rim and having a recess, and pressing said vehicular wheel rim from an inner circumferential wall surface thereof with a ridge disposed on a second die coupled to a rotational shaft at a position corresponding to said recess to raise the outer circumferential wall surface of said vehicular wheel rim; and

rotating said rotational shaft to displace said ridge along the circumferential direction on the inner circumferential wall surface of said vehicular wheel rim, thereby raising said outer circumferential wall surface along the circumferential direction to form a hump portion.

Claim 2 (Previously Presented): A method according to claim 1, wherein said first die has another recess different from said recess, and when said vehicular wheel rim is supported from said outer circumferential wall surface thereof, a curled portion on an end of said vehicular wheel rim is accommodated and supported in said other recess.

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Claim 3 (Previously Presented): A method according to claim 1 or 2, wherein a roller having said ridge projecting from a side circumferential wall thereof is used as said second die.

Claims 4 -5 (Canceled)

Claim 6 (Currently Amended): An apparatus for forming a wheel rim hump portion along a circumferential direction on an outer circumferential wall surface of a vehicular wheel rim gripped by gripping means, comprising:

- a placement table for placing said vehicular wheel rim thereon;
- a first die surrounding the vehicle wheel rim and having a recess, for supporting said vehicular wheel rim from an outer circumferential wall surface thereof;
- a second die coupled to a rotational shaft and having a ridge at a position corresponding to said recess; and
- rotating means for rotating said rotational shaft;
- wherein said vehicular wheel rim is pressed from an inner circumferential wall surface thereof with said ridge of said second die, and plastically deformed material of said vehicular wheel rim is caused to enter said recess of said first die to raise said outer circumferential wall surface of said vehicular wheel rim; and
- wherein said rotational shaft is rotated to displace said ridge along the circumferential direction on the inner circumferential wall surface of said vehicular wheel rim, thereby raising said

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outer circumferential wall surface along the circumferential direction to form a hump portion.

Claim 7 (Previously Presented): An apparatus according to claim 6, wherein said first die has another recess different from said recess, and when said vehicular wheel rim is supported from said outer circumferential wall surface thereof, a curled portion on an end of said vehicular wheel rim is supported in said other recess.

Claim 8 (Previously Presented): An apparatus according to claim 6 or 7, wherein said second die comprises a roller having said ridge projecting from a side circumferential wall thereof.

Claim 9 (Currently Amended): An apparatus according to claim 6 or 7 ~~any one of claims 6 through 8~~, further comprising reversing means for reversing said gripping means.

Claims 10 -13 (Canceled)

Claim 14 (Previously Presented): An apparatus for forming a wheel rim hump portion along a circumferential direction on an outer circumferential wall surface of a vehicular wheel rim gripped by gripping means, comprising:

a placement table for placing said vehicular wheel rim thereon;

a first die having two movable plates each having a recess, said movable plates being

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movable independently of each other;

a second die coupled to a rotational shaft and having a ridge at a position corresponding to said recess; and

rotating means for rotating said rotational shaft;

wherein a curled portion formed by bending an end of said vehicular wheel rim, is moved to a position of said first die while said first die is being open, thereafter one of said movable plates of said first die is closed, and further thereafter the remaining movable plate is closed to close said first die for thereby supporting the outer circumferential wall surface of said vehicular wheel rim,

wherein while the outer circumferential wall surface is supported, said vehicular wheel rim is pressed from an inner circumferential wall surface thereof with said ridge of said second die, and plastically deformed material of said vehicular wheel rim is caused to enter said recess of said first die to raise said outer circumferential wall surface of said vehicular wheel rim; and

wherein said rotational shaft is rotated to displace said ridge along the circumferential direction on the inner circumferential wall surface of said vehicular wheel rim, thereby raising said outer circumferential wall surface along the circumferential direction to form a hump portion.

Claim 15 (Previously Presented): An apparatus according to claim 14, further comprising fixing means for positioning and fixing said first die which is closed.

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Claim 16 (Previously Presented): An apparatus according to claim 14 or 15, wherein a pressing force of said one of said movable plates is greater than a pressing force of said remaining movable plate.

Claim 17 (Previously Presented): An apparatus for forming a wheel rim hump portion along a circumferential direction on an outer circumferential wall surface of a vehicular wheel rim gripped by gripping means, comprising:

a placement table for placing said vehicular wheel rim thereon;

a first die having a recess, for supporting said vehicular wheel rim from an outer circumferential wall surface thereof;

a second die coupled to a rotational shaft and having a ridge at a position corresponding to said recess;

rotating means for rotating said rotational shaft;

a support member for supporting a curled portion from an end face thereof, said curled portion being formed on an end of said vehicular wheel rim; and

support member displacing means for displacing said support member,

wherein said support member is held in abutment against the end face of said curled portion, and the outer circumferential wall surface of said vehicular wheel rim is supported with said first die, and thereafter said vehicular wheel rim is pressed from an inner circumferential wall surface thereof with said ridge of said second die, and plastically deformed material of said vehicular wheel rim is

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caused to enter said recess of said first die to raise said outer circumferential wall surface of said vehicular wheel rim; and

wherein said rotational shaft is rotated to displace said ridge along the circumferential direction on the inner circumferential wall surface of said vehicular wheel rim, thereby raising said outer circumferential wall surface along the circumferential direction to form a hump portion.

Claim 18 (New): An apparatus according to claim 8, further comprising reversing means for reversing said gripping means.